

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

THIS PAGE BLANK (USPTO)



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ³ : B65G 65/23; B65F 3/02, 3/04 B65F 3/08, 9/00, 9/04	A1	(11) International Publication Number: WO 83/ 03242 (43) International Publication Date: 29 September 1983 (29.09.83)
---	----	--

(21) International Application Number: PCT/AU82/00035
(22) International Filing Date: 18 March 1982 (18.03.82)

(71) Applicant (for all designated States except US): WAS-
TEMOVERS PTY. LIMITED [AU/AU]; 40-46
Georgetown Road, Georgetown, NSW 2298 (AU).

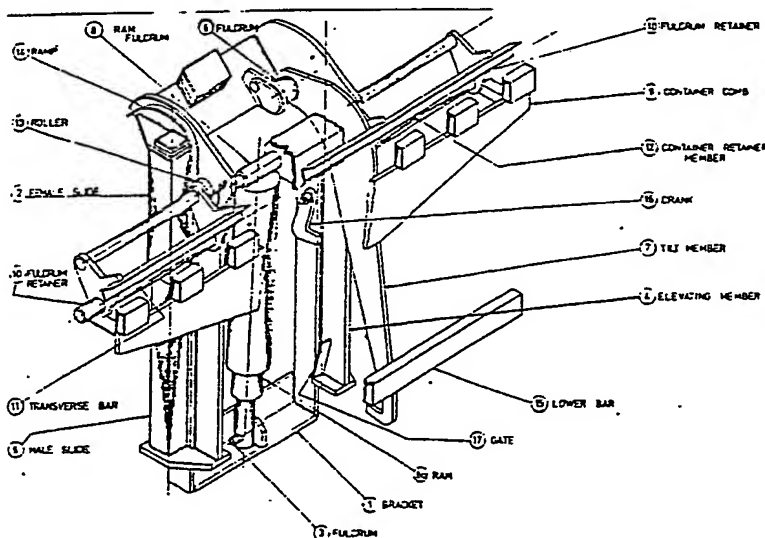
(72) Inventors; and

(75) Inventors/Applicants (for US only) : EGGERS, Henry
[AU/AU]; 4 Kelly Street, Henley, NSW 2111 (AU).
STICPEWICH, John, Warren [AU/AU]; 10 Beach-
worth Road, Pimble, NSW 2073 (AU).

(81) Designated States: AT (European patent), BE (Euro-
pean patent), CH (European patent), DE (European
patent), FR (European patent), GB, GB (European
patent), JP, LU (European patent), NL (European pa-
tent), NO, SE (European patent), US.

Published
With international search report.

(54) Title: MULTIPURPOSE CONTAINER HANDLING DEVICE



(57) Abstract

A container lifting and tipping device for either vehicular or stationary use comprising a bracket (1) mounted to a frame or chassis of a vehicle, compactor, or hopper, an elevating member (4) attached by slides (2) and (5) to bracket (1) tilting member (7) fulcrumed (6) to the elevating member (4) by one end and adjacent to the top of the elevating member (4) a container retaining member (12) automatically activated by means of a roller bearing (13) and ramp (14). Elevation and tilting is controlled and actuated by means of either a hydraulic or pneumatic cylinder (8a).

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	LI	Liechtenstein
AU	Australia	LK	Sri Lanka
BE	Belgium	LU	Luxembourg
BR	Brazil	MC	Monaco
CF	Central African Republic	MG	Madagascar
CG	Congo	MR	Mauritania
CH	Switzerland	MW	Malawi
CM	Cameroon	NL	Netherlands
DE	Germany, Federal Republic of	NO	Norway
DK	Denmark	RO	Romania
FI	Finland	SE	Sweden
FR	France	SN	Senegal
GA	Gabon	SU	Soviet Union
GB	United Kingdom	TD	Chad
HU	Hungary	TG	Togo
JP	Japan	US	United States of America
KP	Democratic People's Republic of Korea		

MULTIPURPOSE CONTAINER HANDLING DEVICE

This invention relates to the elevation and tilting of various size plastic and steel containers to effect the emptying of the load therein into a vehicle or stationary receival hopper.

The invention is concerned mainly with the handling of garbage, waste or refuse in domestic, commercial and industrial areas. This first requires the workman to wheel or otherwise place the container(s) to a suitable position where at the workman then operates a control system to enable the invention to elevate the container(s) whilst coincidentally causing the retention of the container(s) to the device to avoid the container leaving the device and falling into the vehicle or stationary receival hopper. The workman then reverses the cycle to have the container(s) untilted and lowered to the ground, coincidentally being released by the retention device.

The invention is not confined to use in the garbage industry as just recounted but it is primarily intended for use in this connection; and so by way of example it will be described herein mainly in terms thereof.

Garbage collection means of the type under consideration are known and in use; the means herein detailed are, however more efficient, more speedy, less expensive and less damaging to the lifted container and, moreover, can accept a greater range of containers than others.

This invention provides container pickup and emptying means for either vehicular or stationary use comprising:

- (a) A bracket mounted to the frame or chassis of the compactor, hopper or vehicle,
- (b) An elevating member attached by slides to the bracket,
- (c) A tilting member fulcrumed to the elevating member by one end and adjacent to the top of said elevating member and containing a container lifting comb,

(d) A container retaining device automatically activated by means of a roller bearing, ball bearing or bushed roller being acted upon by a formed ramp system.

(e) Means to firstly elevate the elevation member and secondly rotate the tilting member.

An example of the invention is illustrated in the drawing herewith, perspective and, to some extent, schematically.

Referring to the drawing a bracket (1) is fixedly mounted to the frame of the hopper, vehicle chassis or other suitable point. The
10 bracket contains a pair of rectangular, square or circular cross sectioned female slides, (2) fixedly mounted and also a fulcrum point (3) to locate the hydraulic or pneumatic cylinder and ram system to power the operation.

The elevating member (4) is carried on two male slides (5) but the positions of the slides (3) and (5) may be interchanged if desirable. The dimensions of the slides and hence the distance of vertical movement of the elevating member may vary as required by the container to be handled or the receptacle into which the cargo is to be placed.

Fulcrum (6) at the upper end of the elevating member (4) is the
20 tilting member (7). The geometrical position of fulcrum (6) and the ram fulcrum (8) for ram (8A) is a precise position enabling accurate tilting of the container. Tilting member (7) has fixedly mounted to it a container comb (9) which is formed so as to suit the front lip of all encountered containers. Mounted on two or more fulcrums (10) is a transverse bar (11) carrying the container retaining member (12) which is acted upon by one or more roller bearing, ball bearing or roller (13) being in contact with one or more ramp system (14). The form or shape of the ramp (14) is such as to force the depression of the container



retaining member (12) onto the container lip during the tilt motion thus avoiding the container being lost. The ramp system(s) (14) also acts on roller(s) (13) to allow the container retaining member (12) to retract from the container lip and allow the container freedom to leave the comb (9) when the tilting member (7) is lowered.

Elevation and tilting is controlled and acted on by a hydraulic or pneumatic cylinder of conventional means with single or multistage operation.

10 When a container operation is made the workman offers up the container with the lip adjacent to the comb (9), operates the conventional hydraulic control system at which the elevating member (4) rises and the comb (9) engages under the container lip, lifting the container which swings inward until coming against the lower bar (15). Further upward movement of the elevating member (4) lifts the container vertically until the member (4) reaches the end of the travel of slides (3) and (5) whereon cranks (15) engage on gate (16) to retain the slides in arm extended position. The continuing ram action is converted to a rotary motion on the tilting member (7) by the fulcrums (6) and (8). During the tilting operation roller(s) (13) engage against ramp(s) (14) and act upon the container retaining member (12) causing the member (14) to
20 depress relative to the tilting member (7) and this to retain the container.

When the cargo leaves the container the hydraulic or pneumatic circuit is reversed leading to the tilting member (7) revolving to the original vertical position the cranks (15) engaged to stop the slides (3) and (5) from moving and during this operation roller(s) (13) are forced by ramp(s) (14) to cause the container retaining member (12) to elevate relative to the tilting member (7) and hence release the container

from restraint vertically. Completion of the rotary motion of member (7) causes the cranks (15) to be disengaged.

Further retraction of the hydraulic or pneumatic ram (8A) causes elevating member (4) to lower in slides (3) and (5) to the position from which the operation was commenced.

Ramp(s) (14) are formed so as to only allow the container to be retained after commencement of the tilting member (7) action thus avoiding premature or prolonged container retention.



- 5 -

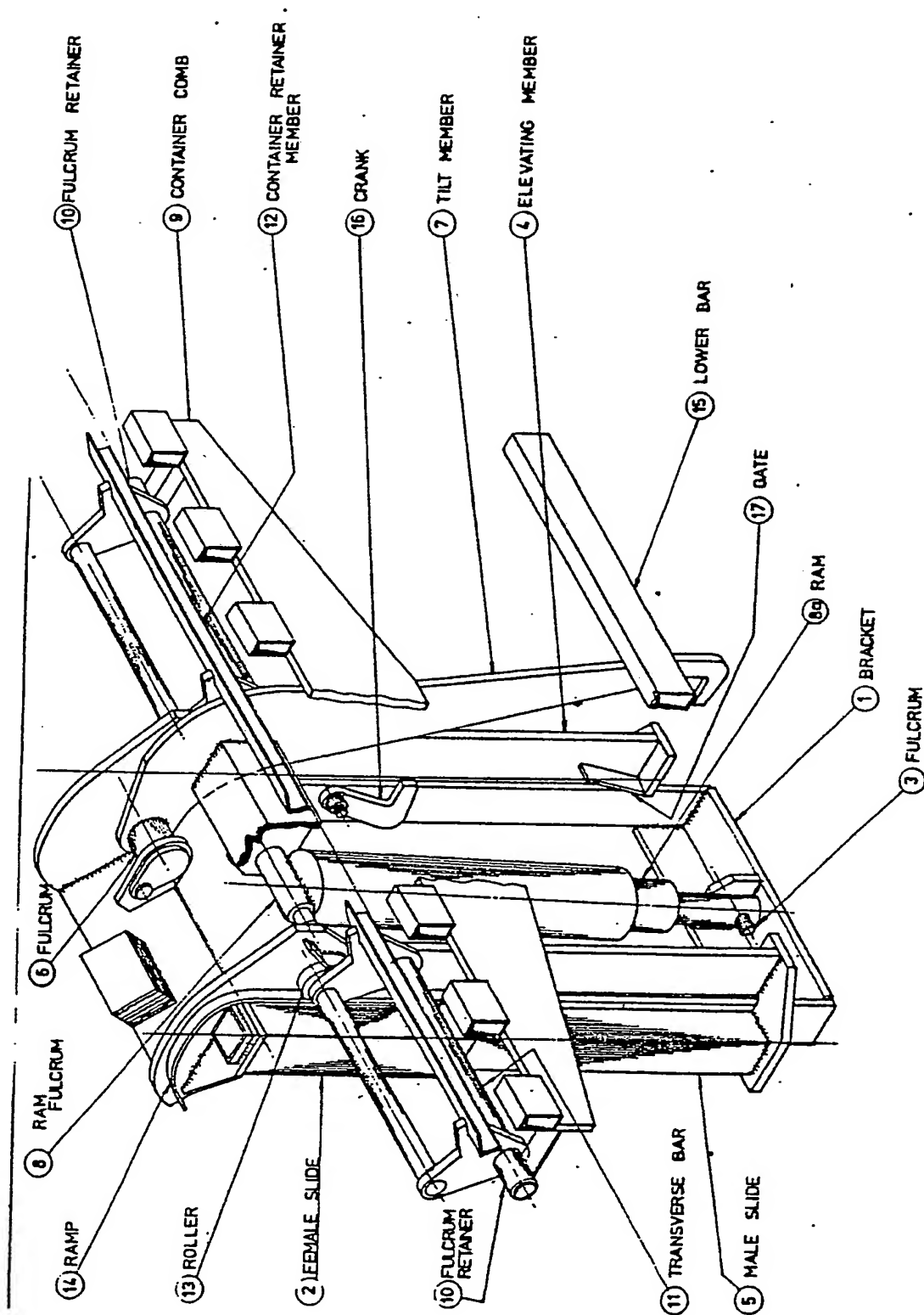
The claims defining this invention are as follows:

Claim 1: In a device for the elevation and tipping of containers, a slide system to allow for varying container heights.

Claim 2: In a device for the elevation and tipping of containers a guide and ramp system to enable retention of the container when in a tipped position.

Claim 3: In a device for the elevation and tipping of containers, a crank system to prohibit lowering of the container before the container is untipped.





SUBSTITUTE SHEET



INTERNATIONAL SEARCH REPORT

International Application No PCT/AU82/00035

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ³ According to International Patent Classification (IPC) or to both National Classification and IPC <p style="text-align: center; margin: 0;">B65G 65/23, B65F 3/02, 3/04, 3/08, B65F 9/00, 9/04</p>																													
II. FIELDS SEARCHED <div style="text-align: center; margin: 5px 0;">Minimum Documentation Searched ⁴</div> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%; border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;">Classification System</div> </td> <td style="border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;">Classification Symbols</div> </td> </tr> <tr> <td style="border: none; text-align: center; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;">IPC US CL</div> </td> <td style="border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;">B65G 65/00, 65/23, B65F 3/02, 3/04, 3/08, B66F 9/00, 9/04 414/422</div> </td> </tr> </table> <div style="text-align: center; margin: 5px 0;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵</div> <p style="margin: 0;">AU: IPC as above Australian classification 86.55, 86.56, 59.95.</p>			<div style="border: 1px solid black; padding: 2px;">Classification System</div>	<div style="border: 1px solid black; padding: 2px;">Classification Symbols</div>	<div style="border: 1px solid black; padding: 2px;">IPC US CL</div>	<div style="border: 1px solid black; padding: 2px;">B65G 65/00, 65/23, B65F 3/02, 3/04, 3/08, B66F 9/00, 9/04 414/422</div>																							
<div style="border: 1px solid black; padding: 2px;">Classification System</div>	<div style="border: 1px solid black; padding: 2px;">Classification Symbols</div>																												
<div style="border: 1px solid black; padding: 2px;">IPC US CL</div>	<div style="border: 1px solid black; padding: 2px;">B65G 65/00, 65/23, B65F 3/02, 3/04, 3/08, B66F 9/00, 9/04 414/422</div>																												
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; padding: 2px;">Category ⁶</th> <th style="width: 70%; padding: 2px;">Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷</th> <th style="width: 20%; padding: 2px;">Relevant to Claim No. ¹⁸</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X</td> <td style="padding: 2px;">AU,A, 52320/79 (ZOLLER-KIPPER G.M.B.H) 8 May 1980 (08.05.80)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X</td> <td style="padding: 2px;">AU,B, 35636/78 (521074) (WORTHINGTON) 29 November 1979 (29.11.79)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X</td> <td style="padding: 2px;">GB,A, 1545555 (HESTAIR DENNIS LIMITED) 10 May 1979 (10.05.79)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X</td> <td style="padding: 2px;">GB,A, 998405 (DENNIS BROTHERS LIMITED) 14 July 1965 (14.07.65)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X,Y</td> <td style="padding: 2px;">GB,A, 899422 (ALLAN BRACEWELL (HYDRAULICS) LIMITED) 20 June 1962 (20.06.62)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X</td> <td style="padding: 2px;">US,A, 3881616 (BLAKELEY et al) 6 May 1975 (06.05.75)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X</td> <td style="padding: 2px;">US,A, 3417888 (NAAB) 24 December 1968 (24.12.68)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top; padding: 2px;">X</td> <td style="padding: 2px;">US,A, 2860795 (ZOLLER) 18 November 1958 (18.11.58) (& DE,B,1017979)</td> <td style="text-align: center; vertical-align: top; padding: 2px;">1-3</td> </tr> </tbody> </table>			Category ⁶	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸	X	AU,A, 52320/79 (ZOLLER-KIPPER G.M.B.H) 8 May 1980 (08.05.80)	1-3	X	AU,B, 35636/78 (521074) (WORTHINGTON) 29 November 1979 (29.11.79)	1-3	X	GB,A, 1545555 (HESTAIR DENNIS LIMITED) 10 May 1979 (10.05.79)	1-3	X	GB,A, 998405 (DENNIS BROTHERS LIMITED) 14 July 1965 (14.07.65)	1-3	X,Y	GB,A, 899422 (ALLAN BRACEWELL (HYDRAULICS) LIMITED) 20 June 1962 (20.06.62)	1-3	X	US,A, 3881616 (BLAKELEY et al) 6 May 1975 (06.05.75)	1-3	X	US,A, 3417888 (NAAB) 24 December 1968 (24.12.68)	1-3	X	US,A, 2860795 (ZOLLER) 18 November 1958 (18.11.58) (& DE,B,1017979)	1-3
Category ⁶	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁸																											
X	AU,A, 52320/79 (ZOLLER-KIPPER G.M.B.H) 8 May 1980 (08.05.80)	1-3																											
X	AU,B, 35636/78 (521074) (WORTHINGTON) 29 November 1979 (29.11.79)	1-3																											
X	GB,A, 1545555 (HESTAIR DENNIS LIMITED) 10 May 1979 (10.05.79)	1-3																											
X	GB,A, 998405 (DENNIS BROTHERS LIMITED) 14 July 1965 (14.07.65)	1-3																											
X,Y	GB,A, 899422 (ALLAN BRACEWELL (HYDRAULICS) LIMITED) 20 June 1962 (20.06.62)	1-3																											
X	US,A, 3881616 (BLAKELEY et al) 6 May 1975 (06.05.75)	1-3																											
X	US,A, 3417888 (NAAB) 24 December 1968 (24.12.68)	1-3																											
X	US,A, 2860795 (ZOLLER) 18 November 1958 (18.11.58) (& DE,B,1017979)	1-3																											
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <p>[*] Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the International filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%; border: none; vertical-align: top;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"Z" document member of the same patent family</p> </td> </tr> </table>			<p>[*] Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the International filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"Z" document member of the same patent family</p>																									
<p>[*] Special categories of cited documents: ¹⁵</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the International filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"Z" document member of the same patent family</p>																												
IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;">Date of the Actual Completion of the International Search ¹</div> <p style="margin: 0;">4 June 1982 (04.06.82)</p> <div style="border: 1px solid black; padding: 2px;">International Searching Authority ¹</div> <p style="margin: 0;">Australian Patent Office</p> </td> <td style="width: 50%; border: none; vertical-align: top;"> <div style="border: 1px solid black; padding: 2px;">Date of Mailing of this International Search Report ²</div> <p style="margin: 0;">(09-06-82) 09 June 1982</p> <div style="border: 1px solid black; padding: 2px;">Signature of Authorized Officer ²⁰</div> <p style="margin: 0;">D.B. CUPITT <i>(Signature)</i></p> </td> </tr> </table>			<div style="border: 1px solid black; padding: 2px;">Date of the Actual Completion of the International Search ¹</div> <p style="margin: 0;">4 June 1982 (04.06.82)</p> <div style="border: 1px solid black; padding: 2px;">International Searching Authority ¹</div> <p style="margin: 0;">Australian Patent Office</p>	<div style="border: 1px solid black; padding: 2px;">Date of Mailing of this International Search Report ²</div> <p style="margin: 0;">(09-06-82) 09 June 1982</p> <div style="border: 1px solid black; padding: 2px;">Signature of Authorized Officer ²⁰</div> <p style="margin: 0;">D.B. CUPITT <i>(Signature)</i></p>																									
<div style="border: 1px solid black; padding: 2px;">Date of the Actual Completion of the International Search ¹</div> <p style="margin: 0;">4 June 1982 (04.06.82)</p> <div style="border: 1px solid black; padding: 2px;">International Searching Authority ¹</div> <p style="margin: 0;">Australian Patent Office</p>	<div style="border: 1px solid black; padding: 2px;">Date of Mailing of this International Search Report ²</div> <p style="margin: 0;">(09-06-82) 09 June 1982</p> <div style="border: 1px solid black; padding: 2px;">Signature of Authorized Officer ²⁰</div> <p style="margin: 0;">D.B. CUPITT <i>(Signature)</i></p>																												

THIS PAGE BLANK (USPTO)